

Taxonomic Studies of Himalayan *Potentilla* (Rosaceae). II. A New Hybrid in Sect. *Leptostylae*

Hiroshi IKEDA¹⁾ and Hideaki OHBA

Department of Botany, University Museum, University of Tokyo,
7-3-1 Hongo, Bunkyo-ku, Tokyo, 113 JAPAN

ヒマラヤ産キジムシロ属（バラ科）の分類学的研究 II

Leptostylae 節の 1 新雑種

池田 博, 大場秀章

東京大学総合研究資料館生物系研究室 113 東京都文京区本郷 7-3-1

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A presumed hybrid, *Potentilla* × *microcontigua*, between *P. contigua* and *P. microphylla*, is described from the alpine region of Himalaya in east Nepal. Morphological characters, chromosome numbers and pollen stainability are compared to the putative parents. This is the first report of the hybrid presumed between species in sect. *Leptostylae*.

Interspecific hybridization seems to occur frequently in *Potentilla* and hybridization is thought to be one of the cause of evolution of some groups in *Potentilla* (Müntzing 1958a, 1958b; Asker 1970a, 1970b, 1971, 1976, 1977). Wolf (1908) listed more than 100 hybrids in his monograph besides about 300 species, but he reported no hybrid in sect. *Leptostylae*.

In sect. *Leptostylae*, Rousi (1965) found natural hybrids in *P. anserina* aggregate and made artificial hybridization between the aggregate. These hybrids were thought to be infraspecific. Really there has not been reported any interspecific hybrid in sect. *Leptostylae*.

We collected presumed hybrid of *Potentilla* on a grassy place by a stream-side at 3900 m elevation in the alpine region of the Jaljale Himal, east

Nepal in 1991 (Fig. 1). *Potentilla contigua* Soják and *P. microphylla* D. Don, belonging to sect. *Leptostylae*, are presumed to be the parents, although they are greatly different in size of leaves and the number of flowers (Table 1). Following Yü and Li's system (1980), *Potentilla contigua* is classified in ser. *Pedunculares* and *P. microphylla* in ser. *Microphyllae*.

The presumed hybrid makes some patches in a disturbed habitat by stream-side. This plant forms a cushion by branching many shoots near the ground and may reproduce vegetatively. This has a possibility to be found from other localities, because there are many places similar to this habitat in the alpine region in Himalaya.

Somatic chromosome numbers of *P. × microcontigua*, *P. contigua* and *P. microphylla* were

Fig. 1. Habit of *Potentilla* \times *microcontigua*.Table 1. Comparison of *Potentilla* \times *microcontigua* and the putative parents.

	<i>P. contigua</i>	<i>P. \times microcontigua</i>	<i>P. microphylla</i>
Base of uppermost leaflet pair	decurrent	cuneate or slightly decurrent	cuneate
Leaf length (cm)	10–20	3–6	3–4
Number of leaflets	30–35	15–23	14–19
*Leaflet length (mm)	10–12	5–8	2–4
*Leaflet width (mm)	5.5–7	3–6	1.5–2.5
*Number of serration	13–15	7–9	5–7
Incision of serration	shallow	medium	deep
Number of flowers	>3	1–3	1(–2)
Petal length (mm)	9–12	6–10	6–7
Chromosome number	2n = 28	2n = 28	2n = 28

*: about the terminal leaflet.

counted in root tips. Root tips were pretreated in 2 mM 8-hydroxyquinoline solution for 2–3 hours and fixed in Newcomer's fluid in the field. Macera-

tion was made in 1N HCl at 60°C for 10.5 minutes, and then the root tips were squashed after stained with 2% lacto-propionic orcein.

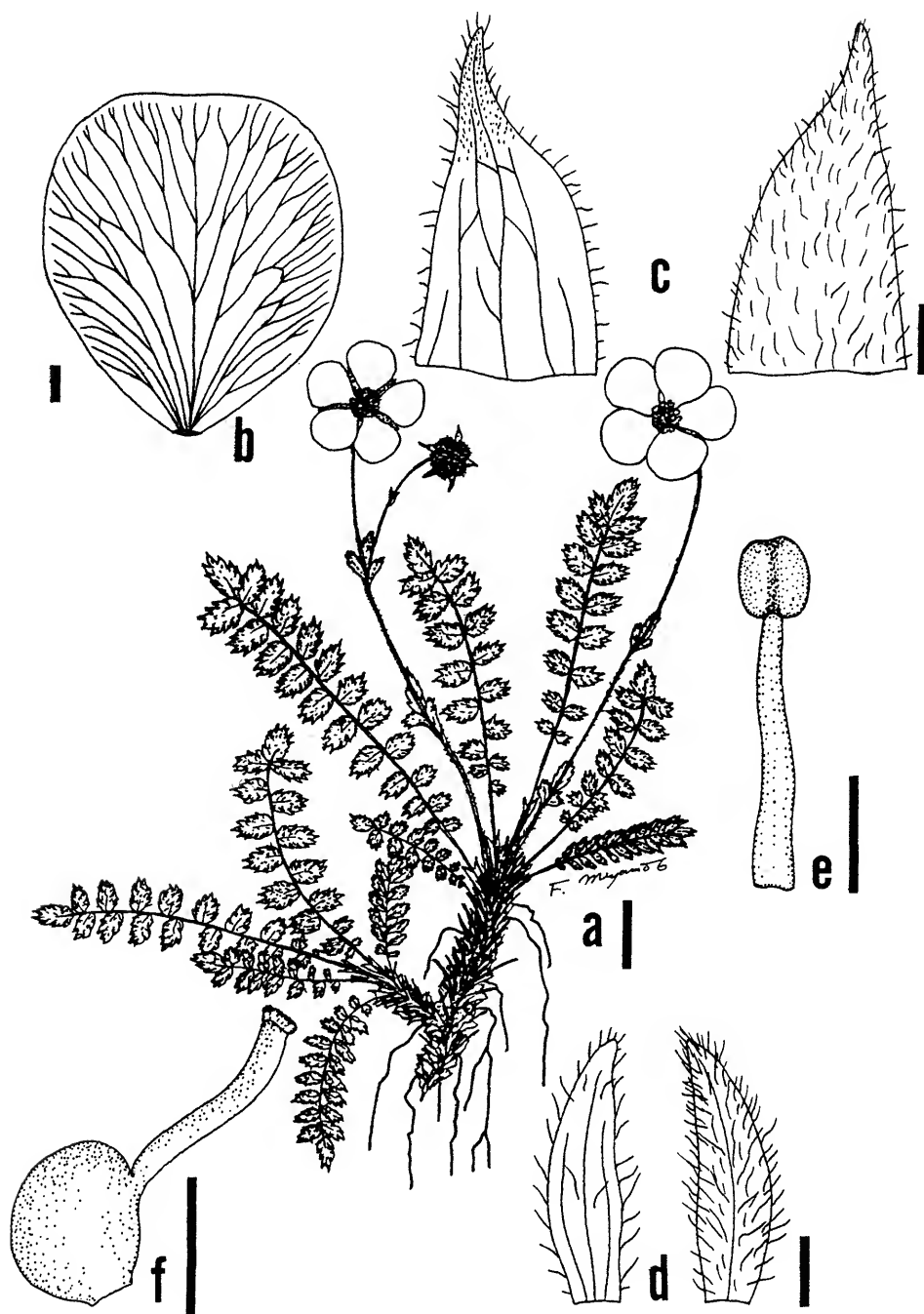


Fig. 2. *Potentilla* \times *microcontigua*. a, habit; b, petal; c, sepals, inner surface (left) and outer surface (right); d, episepals, inner surface (left) and outer surface (right); e, alternipetalous stamen; f, pistil. Bars indicate 1 cm for (a) and 0.1 cm for others.

Pollen stainability was examined after stained with 1% lacto-phenol cotton blue solution.

This paper aims to describe the presumed hybrid, *P. × microcontigua*, comparing with the putative parents.

Potentilla × microcontigua Ikeda et H. Ohba, hybr. nov. Figs. 1–2.

Inter *P. contigua* Soják et *P. microphylla* D. Don quasi intermedia et versimiliter ex hybridatione harum specierum orta; rhizomatis divisionem propagatio asexuali. Pollinis sterilitis crescens. A *P. microphylla* foliolis parte medio incis, majoribus 5–8 × 3–6 nec 2–4 × 1.5–2.5 mm vene differt. Ex *P. contigua* foliis minoribus 3–6 nec 10–20 cm longis, numero foliolorum 15–23 nec 30–35 valde differt.

Perennial acaulescent herb, rhizomes much branched under or nearly at the ground, making a cushion. Radical leaves oblanceolate, 3–6 cm long, 0.7–1.2 cm wide, petiolate, imparipinnate with 7–11 pairs of lateral leaflets; petioles 1–2 cm long; leaflets hairy on both surfaces; terminal leaflet sessile, oblong to obovate, 5–8 mm long, 3–6 mm wide, serrate with 7–9 teeth; lateral leaflets gradually reduced in size towards base, base of uppermost pair cuneate or slightly decurrent. Stipules adnate to the petioles; auricles free.

Peduncles from axils of radical leaves with many unicellular hairs, 2–6 cm long, with 1–2 cauline leaves. Cauline leaves with 3–4 pairs of lateral leaflets in lower, simple in upper. Stipules adnate to the petioles; auricles free, serrate with 5–9 teeth.

Pedicels 1–2.5 cm long with unicellular hairs. Flowers in a dichasium, actinomorphic, 1–1.5 cm across; hypanthia 5–7 mm across. Episepals 5, linear to narrowly lanceolate, 2.5–3.3 mm long, 0.6–1.2 mm wide, entire or divided into two lobes, apex acute or obtuse, hairy on both surfaces. Sepals 5, elliptic to ovate, 3–4 mm long, 2–2.5

mm wide, entire, apex acute or obtuse, hairy on both surfaces and margin. Petals 5, spreading, bright yellow, oblong to broad obovate, 6–10 mm long, 4–8 mm wide with round or retuse apex.

Stamens 20, in 3 whorls; alternipetalous ones 5, from the inner whorl longer than others; oppositipetalous 5, from the middle whorl the shortest; those located between petals and sepals

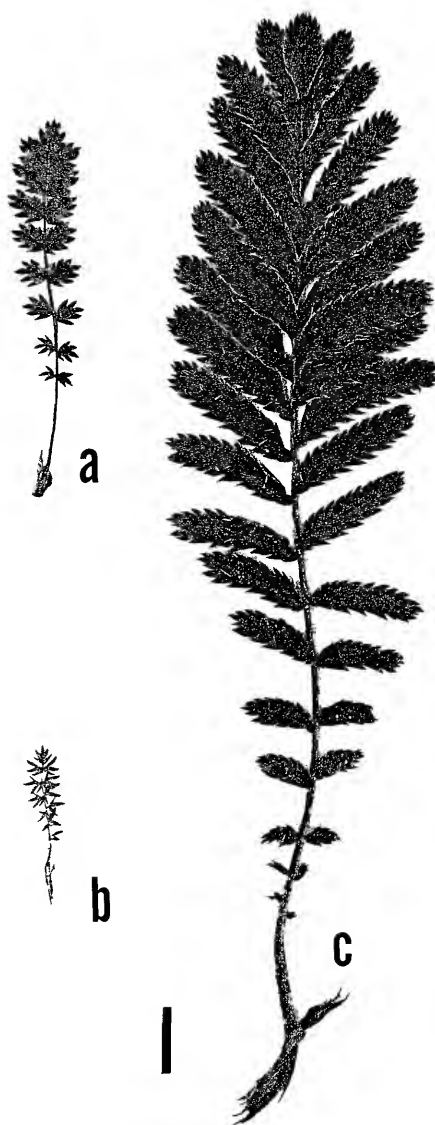


Fig. 3. Leaves of *Potentilla × microcontigua* (a), *P. microphylla* (b) and *P. contigua* (c). Bar indicates 1 cm.

10, from the outer whorl; long stamens 2.5–3 mm long; anthers globose, ellipsoid or ovoid, 0.3–0.5 mm long, 0.2–0.4 mm wide, sub-basal, with 4 locules, yellow before dehiscence. Pistils crowded on receptacles; ovaries ellipsoid to ovoid, smooth, 0.8–1 mm long, 0.7–0.9 mm wide; styles lateral to basal, slender, 1.2–1.5 mm long; stigmas slightly inflated and papillate; placenta located at ventro-lateral side near style base. Chromosome number $2n=28$.

Type: E Nepal. Koshi Zone. Sankhuwa Sabha Distr., Jaljale Himal, Jaljale – Tin Pokhari, 3900 m (H. Ohba, S. Akiyama, H. Ikeda, T. Kikuchi, S. Noshiro, Y. Omori, M. N. Subedi and M. Wakabayashi no. 9130092, TI-holotype; duplicates of the type sent to BM, A and KTM).

Fig. 3 shows the leaves of *P. × microcontigua*, *P. contigua* and *P. microphylla*. Table 1 shows the differences among these. *Potentilla × microcontigua* shows intermediate feature between *P. contigua* and *P. microphylla*.

Chromosome number of these three is $2n=28$ (Fig. 4). Because of the basic chromosome number

of *Potentilla* is $x=7$, these are tetraploids. Karyological study could not made because the chromosomes of each were not stained clearly. This is the first report of the chromosome numbers of *P. contigua* and *P. microphylla* as well as the presumed hybrid.

Pollen stainability of *P. contigua* is 80.9% and that of *P. contigua* is 77.3%, and that of *P. × microcontigua* is 15.0% (Table 2). Although pollen stainability of *P. × microcontigua* is lower than those of *P. contigua* and *P. microphylla*, it is thought to keep the fertility in some degree. We collected specimens of *P. contigua* and *P. microphylla* from many localities in the Jaljale Himal, but could collect *P. × microcontigua* from only a single locality. It is possible that some other

Table 2. Pollen stainability of *Potentilla × microcontigua* and the putative parents. The numbers in parenthesis indicate the number of pollens observed.

<i>P. × microcontigua</i>	15.0% (1017)
<i>P. microphylla</i>	77.3% (1760)
<i>P. contigua</i>	80.9% (2141)

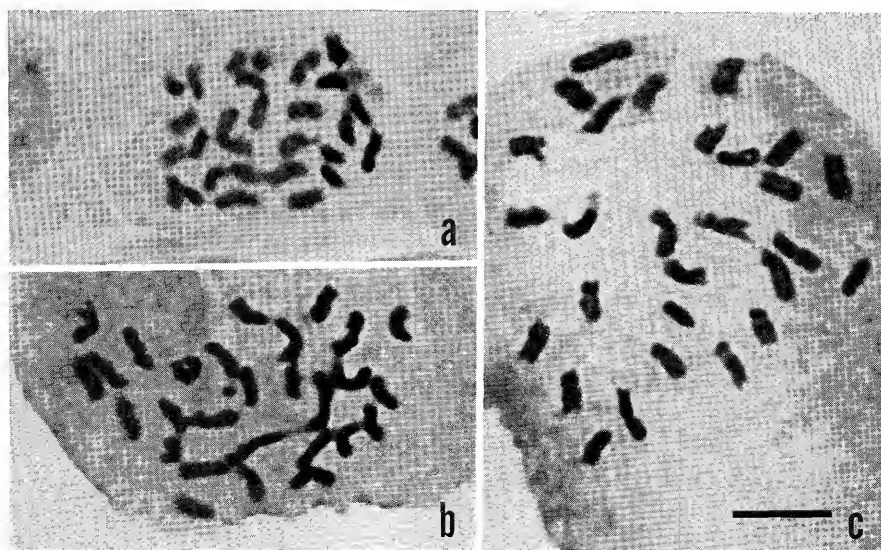


Fig. 4. Somatic chromosomes of *Potentilla × microcontigua* (a), *P. microphylla* (b) and *P. contigua* (c). Bar indicates 5 μ m.

factors restrict the occurrence of the hybrid.

These data from morphological features, chromosome numbers and pollen stainability express that *P. × microcontigua* is derived from the hybridization between *P. contigua* and *P. microphylla*.

Potentilla contigua is classified in ser. Pedunculares and *P. microphylla* in ser. Microphyllae in the differences of leaf size and the number and serration of leaflets (Yü and Li, 1980). The leaves of *P. × microcontigua* are also similar to those of *P. commutata* Lehm. in ser. Microphyllae or *P. tatsienluensis* Wolf in ser. Pedunculares. The fact of occurrence of hybridization between ser. Microphyllae and ser. Pedunculares may give the possibility of derivation of some species in the both series.

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Endnote

¹⁾ Present address: Division of Phylogenetics, Museum of Nature and Human Activities, Hyogo 6 Yayoigaoka, Sanda, Hyogo 669-13 JAPAN

¹⁾ 現住所: 兵庫県立 人と自然の博物館 系統分類研究部 669-13 兵庫県三田市弥生が丘6丁目

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要 旨

東部ネパールヒマラヤ, ジャルジャレヒマールにおいて, *Leptostylae* 節に属す種間の推定雑種を採集した。これは *P. contigua* と *P. microphylla* との雑種と考えられ, 葉長, 小葉長, 小葉幅, 鋸歯数, 鋸歯の切れ込みの程度, 花弁長等が推定両親種の中間の形態を持つ。また, 地下で多数分枝し, クッション状を呈し, 分枝することによって栄養繁殖をしていると考えられるので, *Potentilla × microcontigua* と命名した。染色体数は, *P. × microcontigua*, *P. contigua*, *P. microphylla* 共に $2n=28$ である。花粉稔性は15%ほどあるが, 推定両親種よりも下がっている。*Leptostylae* 節における種間雑種の報告は初めてである。